



# **FIVE QUESTIONS – ONE MISSION**

## **Better Lives for Kentucky's People**

### **Knowledge-Based Economy Programs 2005 Annual Report**

**Council on Postsecondary Education**

**January 20, 2006**



Leon Zernitsky/SIS Illustrations



## Table of Contents

Kentucky Science and Technology Executive Summary	3
Endowment Match Program, “Bucks for Brains”	14
Responsive Doctorate of Philosophy Initiative	15
Connect Kentucky – Research Link	15
Statewide Strategy in Engineering	15
Statewide Strategy in Public Health	15
Biotechnology Industry Organization Conference	16

The Kentucky Innovation Act, HB 572, 2000 Regular Session, created knowledge-based economy programs housed at the Council on Postsecondary Education (Council) and Cabinet for Economic Development. The legislation supported research and development programs and provided funding necessary to create, attract, incubate, and grow high-tech and biotech firms, and to modernize existing manufacturing services. The Council is responsible for submitting an annual report of these programs to the Kentucky Innovation Commission, the Governor, and the General Assembly. This report includes progress made in achieving each program's purposes, qualitative and quantitative information concerning the applications received, projects approved and undertaken, companies served, funding amounts invested in each project or program, and findings and recommendations to increase each program's effectiveness.

Kentucky's postsecondary institutions are engaged in many KBE developed activities individually and collaboratively. These efforts are funded through a variety of sources including the Innovation Act Investment Funds and Science and Technology Trust Funds. The following Knowledge-Based Economy (KBE) Report is a summary *only* of the various activities administered and conducted directly by the Council.

The Council has a variety of KBE activities managed by the Kentucky Science and Technology Corporation (KSTC), with investments in Rural Innovation, Research and Development, Commercialization, and Science and Engineering contracts, funded federally through a network of federal-state partnerships. Detailed reporting of these various "funds" and their differentiation are found on the following pages and briefly illustrated in Table 1.1.

Full reports of each of these programs may be found on the Council's website [www.ky.gov/cpe](http://www.ky.gov/cpe). The following *Highlights'* table provides a summary of the activities of the program for the last 3 years.

# KENTUCKY SCIENCE AND TECHNOLOGY CORPORATION

## Highlights

July 1, 2002 - June 30, 2005

### **660 Investments\***

(12 Universities, 147 Companies, 47 Counties)

**\$25.3 Million State Funds Invested\***

**\$84.0 Million Non-State Matching**

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**\$254.9 Million Follow-On Investments\*\***

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**120 New Companies Formed\*\***

**1,542 New Jobs Created\*\***

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**29 Contracts with Negotiated Payback**

**\$394,089 in Actual ROI from 2 Companies**

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**3 new patents and 56 other invention disclosures  
and patent applications**

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**6,059-Person Database of Expert Reviewers**

**2 Expert Venture Capital Review Panels Formed**

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\* These investments were made under nationally competitive due diligence and professional expert reviews of 975 applications, which requested over \$53 Million.

\*\* Because of the close interrelationship between the Kentucky Enterprise Fund and the Innovation and Commercialization Centers, these numbers include *unduplicated* numbers from both programs, as well as KSEF and EPCSoR.

## **KSTC Background**

Kentucky Science and Technology Corporation (KSTC) is an independent nonprofit enterprise and was incorporated in 1987. Its longstanding mission is "to enhance the capacity of people companies and organizations to develop and apply science and technology and compete responsibly in the global marketplace." The Board of Directors is self-appointing with representatives from the private sector, education including the public and private universities, and other organizations relevant to the KSTC mission.

*Kentucky's Science and Technology Strategy* (1999) was produced by KSTC in coordination with public and private sectors partners and remains a testament to their commitment to advancing innovation in general and the resultant Kentucky Innovation Act specifically.

Table 1.1 presents a concise overview of the qualifications and current status of each of the KBE programs.

## OVERVIEW OF CPE/KBE FUNDS

Table 1.1 Overview of Kentucky Knowledge-Based Economy (KBE) Funds Currently Managed by KSTC

		KBE Fund	KSTC Initiative	Maximum Investment	Eligible Applicants	Selection Process	Return on Investment (ROI)	Impact as of 6/30/05 (FY05) (initial KBE awards made by KSTC in FY02)
CAPITAL	New/Existing Companies	<b>Rural Innovation Fund</b> (proof of concept and early-stage prototype development)	Kentucky Enterprise Fund	up to \$50,000 per year for up to two years	Small, rural companies	External 3rd Party Due Diligence	Payback of <b>2X</b> the Award if over \$25,000; currently <b>4</b> awards with negotiated ROI (Convertible Notes)	<b>\$1,646,103</b> invested in <b>106 rural companies</b> each working with value-added third-party business development resources; <i>Round in Progress: 58 new proposals, of which 19 approved &amp; in contract negotiations</i>
		<b>R&amp;D Vouchers</b> (technology-based product development)	Kentucky Enterprise Fund	up to \$100,000 per year for up to two years	Small and medium companies	External 3rd Party Due Diligence	Payback of <b>2X</b> the Award if over \$25,000; currently <b>22</b> awards with negotiated ROI (Convertible Notes)	<b>\$4,599,732</b> invested in <b>24 company projects</b> each working in collaboration with a Kentucky university; <i>Round in Progress: 10 new proposals in due diligence phase</i>
		<b>ICC Concept Pool</b> (business development tools)	Kentucky Enterprise Fund	up to \$25,000 for one year	ICC companies in good standing	External 3rd Party Due Diligence	Does not impact payback negotiation triggers	<b>\$299,912</b> invested in <b>12 company projects</b> ; <i>Remains Open Year-Round: 2 new applications approved and in contract negotiation phase</i>
		<b>SBIR/STTR Phase Zero and Double Zero Programs</b> (competitive federal business-building tools)	KY Science & Engineering Foundation: Technology Capacity Building	up to \$4,000 per SBIR/STTR proposal submitted	Small companies	Internal and External Reviews	Businesses must submit a federal SBIR/STTR proposal; these and other Technology Capacity Building efforts have leveraged follow-on funding of no less than \$266,636 (excluding FY05 figures)	<b>\$134,416</b> invested in <b>42 small business</b> SBIR/STTR Phase One applications; <i>Remains Open Year-Round: 8 pending applications</i>
		<b>Emerging Technologies</b> (research leading to innovation and technology development)	KY Science & Engineering Foundation: R&D Excellence	up to \$50,000 per year for up to two years	Small companies and university faculty	External Peer Reviews	Payback of <b>2x</b> the Award if over \$25,000 required for companies; currently <b>3</b> awards with negotiated ROI (Convertible Notes)	<b>\$7,757,054</b> invested in <b>148 projects</b> ; <i>Open Round in Progress (KSEF-RDE 008): a record 129 new applications in peer review phase</i>
TALENT / CAPITAL	University Faculty / Pre-Company	<b>Emerging Ideas</b> (research leading to excellence in R&D capacity, peer recognition, competitive federal grants)	KY Science & Engineering Foundation: R&D Excellence	up to \$50,000 per year for up to two years	University faculty	External Peer Reviews	These seed investments in faculty research return considerable follow-on funding for these faculty from federal and industry sources.	
		<b>Commercialization Fund</b> (university-based technology commercialization)	Kentucky Science & Engineering Foundation	up to \$75,000 per year for up to three years	University faculty	Ext. Peer Reviews and 3rd Party Due Diligence	There may be a payback stipulation negotiated on select awards via a royalty agreement through the postsecondary institution	
		<b>Kentucky EPSCoR</b> (building research infrastructure)	Kentucky EPSCoR Program	varies among seven federal agencies	University faculty	Peer Reviews and Federal Reviews	These investments leverage considerable matching from federal sources - \$73.7 million since FY2002	
TALENT	ICCs	<b>Comprehensive business accelerators</b> focused on helping Kentucky entrepreneurs, scientists, and engineers perfect their business strategies and build successful technology companies.			Six regional ICC offices, located in Bowling Green, Covington, Lexington, Louisville, Murray and Richmond, are staffed by professional training to assist businesses and entrepreneur with their unique growth challenges and supported by the statewide headquarters at KSTC.			<b>121</b> companies are active ICC clients in the ICC Commercialization Process; <b>229</b> business plans have been reviewed; <b>50</b> companies have raised <b>\$56M</b> in early-stage capital.

## **Investment Approach**

The implementation of these KBE programs represents a new approach to investing Kentucky funds in Kentucky's future. The newest KBE programs, the Kentucky Enterprise Fund (The Fund) and the Kentucky Science and Engineering Foundation (KSEF), have been designed by KSTC as investments with contractual expectations for returns on investment (ROI) upon financial triggers when a new technology begins to generate substantial revenues. The ROI payback arrangements, primarily for The Fund investments, are the first of their kind in Kentucky, whereby any negotiated financial returns are to be reinvested in KBE programs. This type of negotiation has been completed with 29 companies. In 2005, KSTC received the first payments and stock conversions under these contracts.

## **Program Analyses**

The data analyses of The Fund and KSEF programmatic activities include all investments since 2002, the first year such awards were made by KSTC after the start-up period to create the programs. The Kentucky Experimental Program to Stimulate Competitive Research (EPSCoR) has begun the transition to reporting formats that are conducive to analysis by the state's priority research focus areas. The EPSCoR is funded by seven different federal agencies, which operate on fiscal years different from the State and, in many cases, each other.

## **Priority Focus Areas**

Consistent with the priority focus areas established by the state, KSTC has invested funds under The Fund and KSEF exclusively in the areas of Biosciences, Environmental and Energy Technologies, Human Health and Development, Information Technologies and Communications, and Materials Science and Advanced Manufacturing. EPSCoR has made these a priority where feasible in complying with guidelines with the federal agencies that sponsor EPSCoR funding and with other priorities set by the Statewide EPSCoR Committee.

A searchable database of all awards is available on-line at [www.kstc.com](http://www.kstc.com) for viewing activity in each of these focus areas, by university, by region and by KBE funding program.

## **Kentucky Enterprise Fund (The Fund)**

The Fund is a series of pre-seed and seed stage capital funds aimed at promoting and developing early stage technology companies in the Commonwealth of Kentucky. There are four funds within The Fund: Kentucky Commercialization Fund, Rural Innovation Fund, R&D Voucher Fund, and ICC Concept Pool Fund. The basic eligibility requirements, available funds for each, investment amounts, application frequency and whether or not the investment is subject to payback are provided in Table 1.2.

**TABLE 1.2 Kentucky Enterprise Fund Program Descriptions**

<b>The Fund:</b>	<b>Kentucky Commercialization<sup>1</sup></b>	<b>Rural Innovation</b>	<b>R&amp;D Voucher</b>	<b>ICC Concept Pool</b>
<b>Eligibility:</b>	Proposal must come from university faculty (pre-company) to commercialize a technology/product/process.  Work must be done at faculty member's organization.	Rural Kentucky based companies with less than 150 employees.  Must use funds to contract with a third party consultant.	Kentucky-based companies with less than 150 employees  Must contract with an accredited postsecondary institution.	These funds are a carve-out of the R&D Voucher Fund.  ICC companies in good standing, working the ICC Process.
<b>Target:</b>	Faculty members	Inventors or entrepreneurs	Existing Companies or Entrepreneurs	Existing Companies or Entrepreneurs
<b>Annual State Funding</b>	\$750,000	\$1,000,000	\$2,800,000	\$200,000
<b>Investment Amount(s)</b>	\$75,000/year for up to 3 years	\$50,000/year for up to 2 years	\$100,000/year for up to 2 years	\$25,000 1x award
<b>Matching Requirement</b>	None	None	1:1	1:1
<b>Application Frequency</b>	1x/year	3x/year	3x/year	open
<b>Payback Required?</b>	yes	For any cumulative award amount > \$25,000	yes	no

## **Kentucky Science and Engineering Foundation (KSEF)**

Under the Kentucky Innovation Act, the General Assembly directed KSTC to create and manage KSEF as a means to increase Kentucky's capacity to become a leader state in competitive research by making its own investments in peer-reviewed science and engineering research and by attracting more research funding from all sources to the Commonwealth. This mission is carried out under the following programs:

**R&D Excellence** - purpose is to achieve excellence in science and engineering and allow innovation and technology development in existing and emerging areas of

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<sup>1</sup> The functional operation of the Commercialization Fund, which is open exclusively to university faculty, has been moved under the Kentucky Science & Engineering Foundation effective with the FY06 proposal and new contract between CPE and KSTC for FY06.

research by tracking proactive investments through an annual peer-reviewed competitive selection process.

**TABLE 1.3 KSEF: R&D Excellence Grant Categories**

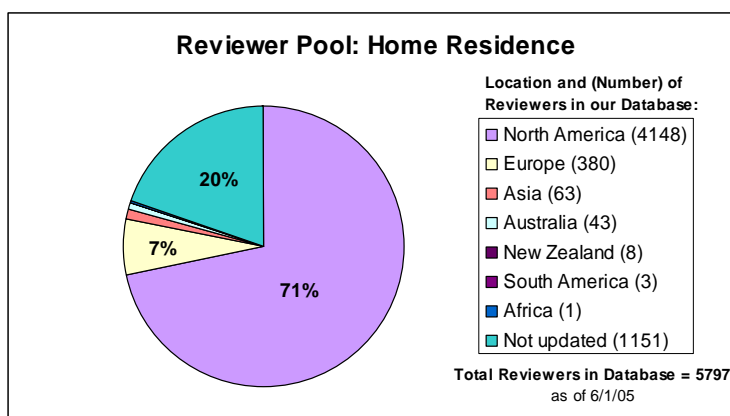
R&D Excellence Grant category	Average Grant Size and Length	Eligibility
Emerging Technologies	\$20,000 - 50,000/Year for up to 2 Years	University Faculty & Small Businesses
Emerging Ideas	\$15,000 - 50,000/Year for up to 2 Years	University Faculty

**Technology Capacity Building** – purpose is to build and enhance capacity in developing intellectual property and technology portfolio and understanding of the technology transfer process and federal programs for small businesses.

**Human Resource Development** – purpose is to build and retain excellent human capital by providing appropriate science and engineering training to students through creative programs and by enhancing the knowledge and skill set of the providers.

#### Peer Reviewers

A recent analysis of the expert peer reviewers who conduct the third-party assessment of the quality and competitiveness of KSEF research project is presented at right. Experts are involved from across the U.S. and around the world.



#### **Experimental Program to Stimulate Competitive Research (KY EPSCoR)**

EPSCoR's mission is to enhance the research and intellectual capacity of universities and colleges by building and coordinating strategic investments in human capital and physical infrastructures necessary for Kentucky to excel in federal R&D funding competitiveness. Kentucky is one of 24 EPSCoR states in a network of federal-state partnerships that focus on the expansion of science, engineering, and technology capabilities to promote national competitiveness for federal research funding. These partnerships help to balance the distribution of federal research dollars and use state or local control in the delivery of program goals.

The Kentucky EPSCoR Program is divided into two programmatic areas: the *Federal Agency EPSCoR Program* which requires state matching funds, and the *KY EPSCoR Infrastructure Seeding Program* which requires institutional matching funds and a commitment to submit a proposal for federal R&D funding. Federal agencies operating EPSCoR programs include: National Science Foundation (NSF), NASA, Department of Energy (DOE), Department of Defense (DOD), Environmental Protection Agency (EPA), National Institutes of Health (NIH) and U.S. Department of Agriculture (USDA).

**TABLE 1.4 Kentucky EPSCoR Program**

<b>Federal Agency Program</b>	<b>Federal Grant Fiscal Year*</b>	<b>Period of Performance*</b>	<b>Federal Requirement for Matching Funds</b>
<b>NSF</b>	6/1-5/31	6/05-5/08	2 to 1
<b>NASA</b>	8/1-7/31	8/01-7/06	1 to 1
<b>DOE</b>	7/1-6/30	7/03-6/06	2 to 1
<b>EPA</b>	varies	varies	1 to 1
<b>NIH</b>	varies	varies	none
<b>DOD</b>	varies	varies	2 to 1
<b>USDA</b>	varies	varies	none
<b>Infrastructure Support (State)</b>	7/1-6/30	varies	varies

\* Updated for activities beginning in FY05

## Investment Overview by CPE/KBE Fund

The following table presents an overview of KSTC's KIA investments for the period of FY02-FY05. Included are analyses of numbers of approved awards (and those approved but later withdrawn by the applicant), State funding investments and non-State matching funds.

**Table 1.5 KSTC OVERVIEW OF INVESTMENTS BY CPE/KBE FUNDS: FY02-FY05**

CPE/KBE FUND	Actual / Approved Investments (#)					Actual / Approved Investments of State KDE Funds (\$)						Cumulative Grand Totals (Actual + Withdrawals)
	FY02	FY03	FY04	FY05	FY02-FY05	FY02	FY03	FY04	FY05	FY02-FY05	FY02-FY05	FY02-FY05
					Withdrawals*					TOTALS	Withdrawals*	
Commercialization Fund	7	2	8	6	22  8	477,553	149,999	459,137	449,976	1,536,665		1,536,665
Rural Innovation	13	29	49	11		628,200	327,346	802,859	193,255	1,951,660	364,300	2,315,960
R&D Voucher	6	5	15	3		599,732	600,000	2,300,000	600,000	4,099,732	1,099,480	5,199,212
Early Concept Pool	-	4	4	4		-	100,000	100,000	100,000	300,000		300,000
The Fund Annual Subtotals	26	40	76	24		1,705,485	1,177,345	3,661,996	1,343,231	7,888,057	1,463,780	9,351,837
The Fund Subtotal				166				7,888,057			\$ 9,351,837	
KSEF	31	53	53	46	2	2,086,617	2,203,865	1,910,802	1,740,934	7,942,218	31,500	7,973,718
KSEF Subtotal **				183					7,942,218			\$ 7,973,718
EPSCoR	55	78	78	100		2,342,600	2,631,000	2,302,600	2,211,900	9,488,100		9,488,100
EPSCoR Subtotal ***				311					9,488,100			\$ 9,488,100
Annual Grand Totals	112	171	207	170	32	\$ 6,134,702	\$6,012,210	\$7,875,398	\$ 5,296,065	\$ 25,318,375	\$ 1,495,280	\$ 26,813,655
FY02-FY05 GRAND TOTAL	660					\$ 25,318,375						

\* These awards were approved by KSTC but later withdrawn by the applicant and are presented here for overall context on the volume of activity managed by KSTC.

\*\* This amount exceeds the contract amount for program awards due to a limited amount being supported partially from the KSEF administration budget.

\*\*\* For consistency, these figures do not include an estimated 55 awards under EPSCoR in the amount of \$2,429,600 for FY01, which brings the total amount to \$11,917,700 for 366 awards in all years; all other KBE awards began in FY02.

Table 1.5 Supplement

**KSTC OVERVIEW OF INVESTMENTS BY  
Rural Innovation Fund: Levels 1 and 2  
FY02-FY05**

Rural Innovation Fund	Actual / Approved Investments (#)					Actual / Approved Investments of State KDE Funds (\$)						Cumulative Grand Totals (Actual + Withdrawals)
	FY02	FY03	FY04	FY05	FY02-FY05 Withdrawals*	FY02	FY03	FY04	FY05	FY02-FY05 TOTALS	FY02-FY05 Withdrawals*	FY02-FY05
Rural - Level 1	9	23	45	11	19	539,000	172,500	610,359	193,255	1,515,114	196,800	1,711,914
Rural - Level 2	4	6	4	-	3	89,200	154,846	192,500	-	436,546	167,500	604,046
Rural Annual Subtotals	13	29	49	11	22	628,200	327,346	802,859	193,255	1,951,660	364,300	2,315,960
Rural Levels 1 & 2	<b>102</b>					<b>\$1,951,660</b>						\$ 2,315,960

\* These awards were approved by KSTC but later withdrawn by the applicant and are presented here for overall context on the volume of activity managed by KSTC.

**Table 1.6 KSTC Overview of Non-State Matching Funds by CPE/KBE Program: FY02-FY05**

CPE/KBE FUND	Non-State Matching on Investments* (\$)			
	FY02	FY03	FY04	FY05
KY Enterprise Fund				
Commercialization	-	-	-	
Rural Innovation	-	11,071	43,500	
R&D Voucher	1,011,586	1,703,905	1,449,801	400,000
Early Concept Pool	-	122,451	121,625	150,000
KY Enterprise Fund	1,011,586	1,837,427	1,614,926	550,000
Cumulative Subtotal	5,013,939			
KSEF		1,359,722	1,148,928	1,852,999
Cumulative Subtotal	4,361,649			
EPSCoR	17,069,950	19,080,909	19,059,724	21,980,452
Cumulative Subtotal	77,191,035			
<b>Annual Grand Totals</b>	\$ 18,081,536	\$ 19,441,258	\$22,067,264	\$ 24,383,451
<b>CUMULATIVE GRAND TOTAL</b>	83,973,509			

\* Includes federal, industrial and private sources; does not include "Institutional Match" by universities. Also see the program chapters for details on additional funds leveraged by awardees as a result of the investment of State funds.

\*\* Effective in this reporting year (FY05), the KSEF R&D Excellence Program no longer requires matching but focuses on leveraging of follow-on awards from other non-state sources, which is reported elsewhere; however, for broad context KSEF matching that has been reported voluntarily by awardees is presented here.

### **Due Diligence Process**

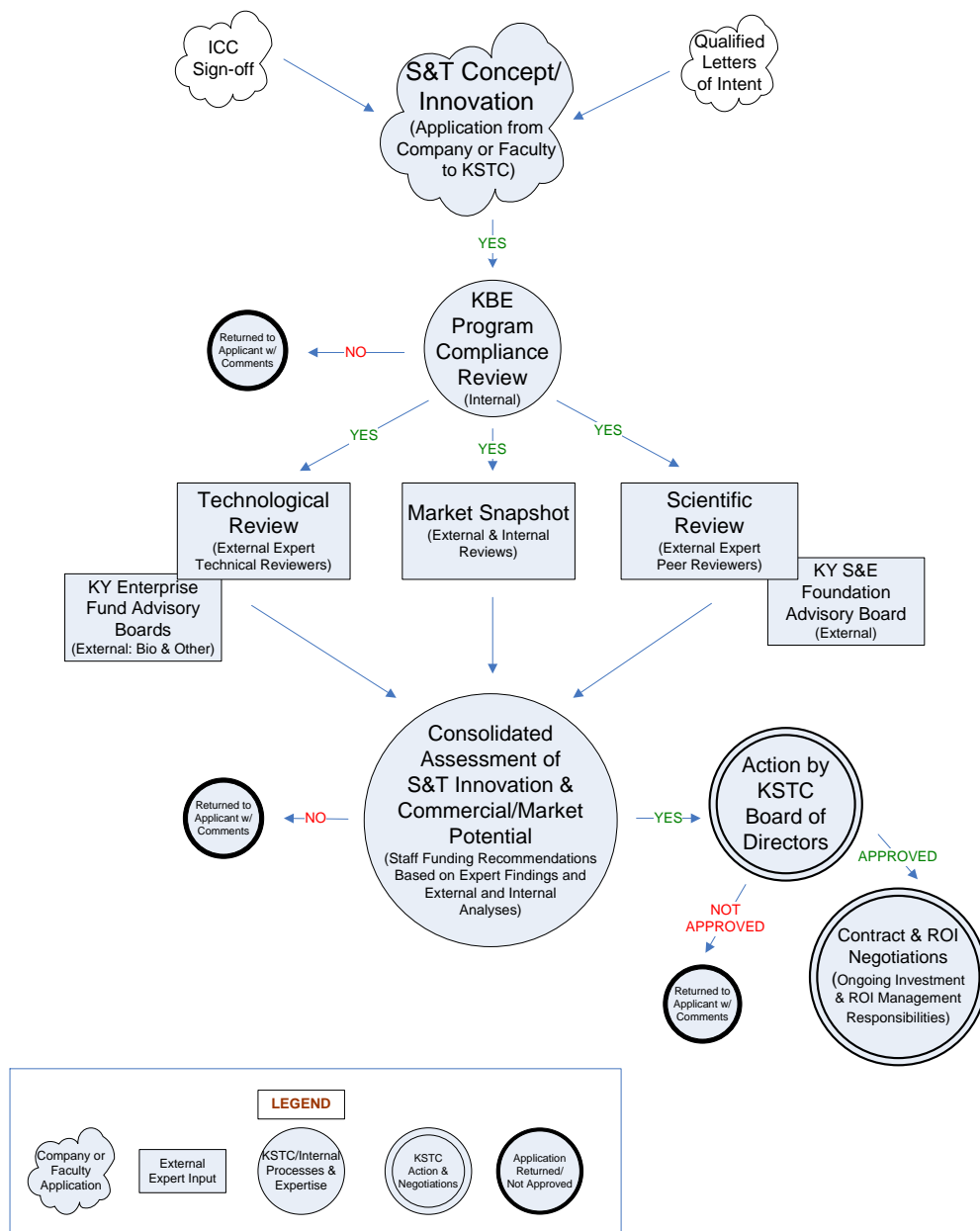
KSTC created and now implements a rigorous due diligence process (illustrated below) for making KBE investments in both companies and faculty<sup>2</sup> that apply for KBE funding. Summarized below are the internal and external stages of this application-review process used by the Kentucky Enterprise Fund and the Kentucky Science and Engineering Foundation. A listing of dedicated, experienced expertise and resources already in place to support the rigorous review and due diligence of

<sup>2</sup> In addition to the due diligence process presented here, the Kentucky EPSCoR Program institutes in-depth review protocols in compliance with standards set by seven federal agencies.

KBE applications under The Fund and KSEF may be found in the KSTC Full Annual Report.

## KSTC's KBE Science & Technology Application-Review Processes

*Kentucky Enterprise Fund / Kentucky Science & Engineering Foundation*



## **THE ENDOWMENT MATCH PROGRAM**

### **“Bucks for Brains”**

The Endowment Match Program matches state funds dollar-for-dollar with private gifts to grow endowments and encourage research at Kentucky's public universities. Endowment proceeds are used to fund endowed chairs, professorships, research scholars, research staff, graduate fellowships, undergraduate scholarships, research infrastructure, and mission support at these institutions. The program received General Fund appropriations of \$110 million in 1998-00 and \$120 million in 2000-02. The 2003 Budget Bill (HB 269) appropriated \$11,856,000 to pay debt service on a bond issue that provided another \$120 million for the program in 2002-04. The Program received no additional funding in 2004-2006.

Since it began, Bucks for Brains has helped Kentucky's universities create 111 new endowed chairs and 176 new endowed professorships. Council guidelines stipulate that program funds also may be used to support endowed fellowships and scholarships and provide support for institutional missions. At the two research universities, at least 70 percent of program funds must be used in five new economy priority areas:

- human health and development
- biosciences
- materials science and advanced manufacturing
- information technologies and communications
- environmental and energy technologies

The primary method of participation by the comprehensive universities is through their Programs of Distinction. Each university has identified at least one program for which it wants to be known nationally.

- Eastern Kentucky University chose its nationally recognized College of Justice and Safety
- Kentucky State University expanded its aquaculture program
- Morehead State University created the Institution for Regional Analysis and Public Policy to study issues in Appalachia
- Murray State University established a telecommunication systems management program
- Northern Kentucky University created the Center for Integrated Natural Sciences and Applied Mathematics to offer cross-disciplinary study in the sciences
- Western Kentucky University funds two programs:
  - the Applied Research and Technology Program focusing on science and mathematics at the Ogden College of Science and Engineering; and
  - the Center for 21st Century Media housing its journalism and forensics programs.

## **RESPONSIVE DOCTORATE OF PHILOSOPHY INITIATIVE**

Growing numbers of employers from the academic and private sectors have called for reforms in doctoral education in the United States. The Woodrow Wilson National Fellowship Foundation's Responsive Ph.D. Initiative supports university efforts to increase the quality of the doctoral experience for students. The University of Kentucky and the University of Louisville were selected to participate in the project jointly in 2003, in part due to Kentucky's investment in faculty, research, and doctoral education through its Bucks for Brains program. The program encourages participating universities to focus on four issues: promoting interdisciplinary scholarship, encouraging pedagogical training, improving diversity, and applying academic expertise to social challenges. Initiatives include U of L's Future Leaders Program, which will encourage collaboration among institutions and with non-academic business and industry partners, and the Ph.D. Completion Project, which will focus on improved mentoring and financial support for doctoral students.

## **RESEARCH LINK**

Connect Kentucky is an alliance of businesses, government entities, and universities that work together to accelerate technology growth in the Commonwealth through broadband expansion, research, governmental affairs, public relations, and high-tech recruiting. In FY 2005, Connect Kentucky was contracted by the Council to continue the work begun by the former Office of New Economy for the Commonwealth in the development of a **Research Link** to all of Kentucky's funded research. This web-based datastor of all of the public postsecondary education institutions' research is available for viewing by faculty researchers, public and private investors interested in the research capabilities of Kentucky's academic pursuits, interested scientists, and students. Future enhancements include researcher profiles, institutional centers and institutes with specialized equipment, academic publications and tools to further encourage collaborative research endeavors among Kentucky's finest minds.

## **STATEWIDE STRATEGIES IN ENGINEERING AND PUBLIC HEALTH**

A similar joint program of Engineering began in 2001 with funding from the Science and Technology Trust Funds to engage more students in careers of science and math leading to advancing the technology-trained Kentucky workforce. This joint program involves the leadership of engineering faculty at Murray State University, Western Kentucky, University of Kentucky, and University of Louisville. Through distance learning more students across the Commonwealth have access to careers in engineering. These joint programs enrolled 2690 students in FY 05, an increase of over 18%.

The Statewide Engineering Strategy also calls for P-16 programs to increase the number of students preparing for careers in engineering and related careers. The Council has convened private sector, P-12, and postsecondary representatives to develop this strategy. The 2006-2008 Council budget request contains funding to implement programs in middle/high schools and community colleges that will increase the number of students in the pipeline for careers in engineering and science, technology, and math while utilizing the increased capacity created by the joint programs. An outcome of P-16 Council efforts statewide has yielded a two percent increase overall in the number of high school juniors declaring engineering as a college major, as recorded by recent ACT survey data of Kentucky students over the past two years.

Joint Programs among Kentucky's postsecondary institutions have been collaborating on strategies to educate future workers in public health, and train the current public health workforce in 21<sup>st</sup> century applications and increase research funding in public health. A knowledge-base is needed to adequately prepare health care workers in the areas of new science as it relates to diseases that prevail in Kentucky due to limited education and harmful health behaviors. Not often seen as a contributor to economic gain is the health and welfare of a state's citizens. These joint programs and schools of public health (Eastern Kentucky University, Western Kentucky University, University of Kentucky, and University of Louisville) are maximizing the faculties' capacity to train students in the five core curricula leading to professions of public health. This collaborative effort to address the strategic health needs of our state will extend the academic roles of public health faculty into the workplace and beyond, with on-line learning opportunities and shared resources. In 2005, the University of Kentucky's School of Public Health became accredited and Western Kentucky University's program of Public Health received continuing accreditation from the Council on Education in Public Health (the national accreditation organization). The University of Louisville has completed their self-study, a step in the process of their school's accreditation and Eastern Kentucky University is also in the process of achieving accreditation for their program.

## **BIOTECHNOLOGY INDUSTRY ORGANIZATION CONFERENCE**

The Biotechnology Industry Organization (BIO) Conference took place June 19-22, 2005, in Philadelphia. BIO represents more than 1,000 biotechnology companies, academic institutions, state biotechnology centers, and related organizations in all 50 states and 35 other nations. BIO centers are involved in the research and development of health care, agricultural, industrial, and environmental biotechnology products. For the sixth consecutive year, Kentucky participated with an exhibit attracting business, researchers, and entrepreneurs to Kentucky; showcasing the Commonwealth, its universities, communities, and businesses; highlighting Kentucky's capabilities and opportunities; and mobilizing additional venture capital investment in the Commonwealth. For more information about BIO, visit [www.bio.org](http://www.bio.org).

This summary of the Council's efforts as they relate to a knowledge-based economy is limited to those major efforts described above. In reality all of the work of higher education is to prepare students, whether traditional or adult learners to lead productive lives, contributing to the economy in their communities, state, and nation. It is difficult to separate any of the work of higher education from its impact on a "knowledge-based economy." For full reports of any of the contributions of the Kentucky Council on Postsecondary Education to this effort, please visit the Council's web site at [www.ky.gov/cpe](http://www.ky.gov/cpe).